The Bitter Truth About *ARTIFICIAL SWEETENERS*

Aspartame sugar substitutes cause worrying symptoms from memory loss to brain tumours.

But despite US FDA approval as a 'safe' food additive, aspartame is one of the most dangerous substances ever to be foisted upon an unsuspecting public.

Part 1

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THE MOST DANGEROUS FOOD ADDITIVE?

Aspartame is the technical name for the brand names *NutraSweet*, *Equal*, *Spoonful*, and *Equal-Measure*. Aspartame was discovered by accident in 1965, when James Schlatter, a chemist of G. D. Searle Company, was testing an anti-ulcer drug. Aspartame was approved for dry goods in 1981 and for carbonated beverages in 1983. It was originally approved for dry goods on 26 July 1974, but objections filed by neuroscience researcher Dr John W. Olney and consumer attorney James Turner in August 1974, as well as investigations of G. D. Searle's research practices, caused the US Food and Drug Administration (FDA) to put approval of aspartame on hold (5 December 1974). In 1985, Monsanto purchased G. D. Searle and made Searle Pharmaceuticals and The NutraSweet Company separate subsidiaries.

Aspartame is by far the most dangerous substance on the market that is added to foods. Aspartame accounts for over 75% of the adverse reactions to food additives reported to the US Food and Drug Administration (FDA). Many of these reactions are very serious, including seizures and death as recently disclosed in a February 1994 Department of Health and Human Services report.[1]

A few of the 90 different documented symptoms listed in the report as being caused by aspartame include: headaches/migraines, dizziness, seizures, nausea, numbness, muscle spasms, weight gain, rashes, depression, fatigue, irritability, tachycardia, insomnia, vision problems, hearing loss, heart palpitations, breathing difficulties, anxiety attacks, slurred speech, loss of taste, tinnitus, vertigo, memory loss and joint pain.

According to researchers and physicians studying the adverse effects of aspartame, the following chronic illnesses can be triggered or worsened by ingestion of aspartame[2]: brain tumours, multiple sclerosis, epilepsy, chronic fatigue syndrome, Parkinson's disease, Alzheimer's disease, mental retardation, lymphoma, birth defects, fibromyalgia and diabetes.

Aspartame is made up of three chemicals: aspartic acid, phenylalanine and methanol. The book, *Prescription for Nutritional Healing*, by James and Phyllis Balch, lists aspartame under the category of "chemical poison". As you shall see, that is exactly what it is.

ASPARTIC ACID (40% OF ASPARTAME)

Dr Russell L. Blaylock, a Professor of Neurosurgery at the Medical University of Mississippi, recently published a book thoroughly detailing the damage that is caused by the ingestion of excessive aspartic acid from aspartame. Aspartic acid makes up 40% of aspartame; glutamic acid is 99% of monosodium glutamate (MSG). The damage MSG causes is also documented in Blaylock's book. Blaylock makes use of almost 500 scientific references to show how excess free excitatory amino acids such as aspartic acid and glutamic acid in our food supply are causing serious chronic neurological disorders and myriad other acute symptoms.[3]

HOW ASPARTATE (AND GLUTAMATE) CAUSE DAMAGE

Aspartate and glutamate act as neurotransmitters in the brain by facilitating the transmission of information from neuron to neuron. Too much aspartate or glutamate in the brain kills certain neurons by allowing the influx of too much calcium into the cells. This influx triggers excessive amounts of free radicals which kill the cells. The neural cell damage that can be caused by excessive aspartate and glutamate is why they are referred to as "excitotoxins". They "excite" or stimulate the neural cells to death.

Aspartic acid is an amino acid. Taken in its free form (unbound to proteins) it significantly raises the blood plasma level of aspartate and glutamate. The excess aspartate and glutamate in the blood plasma shortly after ingesting aspartame or products with free glutamic acid (glutamate precursor) leads to a high level of those neurotransmitters in certain areas of the brain.

The blood-brain barrier (BBB) which normally protects the brain from excess glutamate and aspartate as well as toxins (1) is not fully developed during childhood, (2) does not fully protect all areas of the brain, (3) is damaged by numerous chronic and acute conditions, and (4) allows seepage of excess glutamate and aspartate into the brain even when intact.

The excess glutamate and aspartate slowly begin to destroy neurons. The large majority (75%+) of neural cells in a particular area of the brain are killed before any clinical symptoms of a chronic illness are noticed.

A few of the many chronic illnesses that have been shown to be contributed to by long-term exposure excitatory amino acid damage include: multiple sclerosis (MS), ALS, memory loss, hormonal problems, hearing loss, epilepsy, Alzheimer's disease, Parkinson's disease, hypoglycaemia, AIDS dementia, brain lesions and neuroendocrine disorders.

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The risks to infants, children, pregnant women, the elderly and persons with certain chronic health problems from excitotoxins are great. Even the Federation of American Societies For Experimental Biology (FASEB), which usually understates problems and mimics the FDA party-line, recently stated in a review that "it is prudent to avoid the use of dietary supplements of L-glutamic acid by pregnant women, infants, and children. The existence of evidence of potential endocrine responses, i.e., elevated cortisol and prolactin, and differential responses between males and females, would also suggest a neuroendocrine link and that supplemental L-glutamic acid should be avoided by women of childbearing age and individuals with affective disorders."[4] Aspartic acid from aspartame has the same deleterious effects on the body as glutamic acid.

The exact mechanism of acute reactions to excess free glutamate and aspartate is currently being debated. As reported to the FDA, those reactions include[5]: headaches/migraines, nausea, abdominal pains, fatigue (blocks sufficient glucose entry into brain), sleep problems, vision problems, anxiety attacks, depression and asthma/chest tightness.

One common complaint of persons suffering from the effect of aspartame is memory loss. Ironically, in 1987, G. D. Searle, the manufacturer of aspartame, undertook a search for a drug to combat memory loss caused by excitatory amino acid damage.

Blaylock is one of many scientists and physicians who are concerned about excitatory amino acid damage caused by ingestion of aspartame and MSG. One of the many experts who have spoken out against the damage being caused by aspartate and glutamate is Adrienne Samuels, Ph.D., an experimental psychologist specialising in research design. Another is Dr John Olney, a professor in the Department of Psychiatry, School of Medicine, Washington University, a neuroscientist and researcher, and one of the world's foremost authorities on excitotoxins. (He informed Searle in 1971 that aspartic acid caused holes in the brain of mice.) Also included is Francis J. Waickman, M.D., a recipient of the Rinkel and Forman Awards, and board-certified in paediatrics, allergy and immunology.

Other concerned scientists include John R. Hain, M.D., board-certified forensic pathologist, and H. J. Roberts, M.D., F.A.C.P., F.C.C.P., diabetes specialist and selected by a national medical publication as "the best doctor in the US". John Samuels is concerned, also. He compiled a list of scientific research sufficient to show the dangers of ingesting excess free glutamic and aspartic acid. And there are many more who can be added to this long list.

PHENYLALANINE (50% OF ASPARTAME)

Phenylalanine is an amino acid normally found in the brain. Persons with the genetic disorder phenylketonuria (PKU) cannot metabolise phenylalanine. This leads to dangerously high levels of phenylalanine in the brain (sometimes lethal).

It has been shown that ingesting aspartame, especially along with carbohydrates, can lead to excess levels of phenylalanine in the brain even in persons who do not have PKU. This is not just a theory, as many people who have eaten large amounts of aspartame over a long period of time and do not have PKU have been shown to have excessive levels of phenylalanine in the blood.

Excessive levels of phenylalanine in the brain can cause the levels of seratonin in the brain to decrease, leading to emotional disorders such as depression. It was shown in human testing that phenylalanine levels of the blood were increased significantly in human subjects who chronically used aspartame.[6] Even a single use of aspartame raised the blood phenylalanine levels.

In his testimony before the US Congress, Dr Louis J. Elsas showed that high blood phenylalanine can be concentrated in parts of the brain, and is especially dangerous for infants and foetuses. He also showed that phenylalanine is metabolised much more efficiently by rodents than by humans.[7]

One account of a case of extremely high phenylalanine levels caused by aspartame was recently published in the *Wednesday Journal*, in an article entitled "An Aspartame Nightmare". John Cook began drinking six to eight diet drinks every day. His symptoms started out as memory loss and frequent headaches. He began to crave more aspartame-sweetened drinks. His condition deteriorated so much that he experienced wide mood swings and violent rages. Even though he did not suffer from PKU, a blood test revealed a phenylalanine level of 80 mg/dl. He also showed abnormal brain function and brain damage. After he kicked his aspartame habit, his symptoms improved dramatically.[8]

As Blaylock points out in his book, early studies measuring phenylalanine buildup in the brain were flawed. Investigators who measured specific brain regions and not the average throughout the brain noticed significant rises in phenylalanine levels. Specifically, the hypothalamus, medulla oblongata, and corpus striatum areas of the brain had the largest increases in phenylalanine. Blaylock goes on to point out that excessive buildup of phenylalanine in the brain can cause schizophrenia or make one more susceptible to seizures.

Therefore, long-term excessive use of aspartame may provide a boost to sales of seratonin reuptake inhibitors such as Prozac and drugs to control schizophrenia and seizures.

METHANOL, ALSO KNOWN AS WOOD ALCOHOL/ POISON (10% OF ASPARTAME)

Methanol/wood alcohol is a deadly poison. Some people may remember methanol as the poison that has caused some 'skid row' alcoholics to end up blind or dead. Methanol is gradually released in the small intestine when the methyl group of aspartame encounters the enzyme chymotrypsin.

The absorption of methanol into the body is sped up considerably when free methanol is ingested. Free methanol is created from aspartame when it is heated to above 30°C (86°F). This would occur when an aspartame-containing product is improperly stored or when it is heated (e.g., as part of a 'food' product such as *Jello*).

Methanol breaks down into formic acid and formaldehyde in the body. Formaldehyde is a deadly neurotoxin. An EPA assessment of methanol states that methanol "is considered a cumulative poison due to the low rate of excretion once it is absorbed. In the body, methanol is oxidised to formaldehyde and formic acid; both of these metabolites are toxic." They recommend a limit of consumption of 7.8 mg/day. A one-litre (approx. 1 quart) aspartame-sweetened beverage contains about 56 mg of methanol. Heavy users of aspartame-containing products consume as much as 250 mg of methanol daily or 32 times the EPA limit.[9]

Symptoms from methanol poisoning include: headaches, ear buzzing, dizziness, nausea, gastrointestinal disturbances, weakness, vertigo, chills, memory lapses, numbness and shooting pains in the extremities, behavioural disturbances, and neuritis. The most well-known problems from methanol poisoning are vision problems, including misty vision, progressive contraction of visual fields, blurring of vision, obscuration of vision, retinal damage and blindness. Formaldehye is a known carcinogen, causes retinal damage, interferes with DNA replication and causes birth defects.[10]

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As pointed out by Dr Woodrow C. Monte, Director of the Food Science and Nutrition Laboratory at Arizona State University, "There are no human or mammalian studies to evaluate the possible mutagenic, teratogenic or carcinogenic effects of chronic administration of methyl alcohol."[11]

He was so concerned about the unresolved safety issues that he filed suit with the FDA, requesting a hearing to address these issues. He asked the FDA to "slow down on this soft-drink issue long enough to answer some of the important questions. It's not fair that you are leaving the full burden of proof on the few of us who are concerned and have such limited resources. You must remember that you are the American public's last defense. Once you allow usage [of aspartame], there is literally nothing I or my colleagues can do to reverse the course. Aspartame will then join saccharin, the sulfiting agents and God knows how many other questionable compounds enjoined to insult the human constitution with governmental approval."[10]

Shortly thereafter, the Commissioner of the FDA, Arthur Hull Hayes, Jr, approved the use of aspartame in carbonated beverages. He then left for a position with G. D. Searle's public relations firm.[11]

It has been pointed out that some fruit juices and alcoholic beverages contain small amounts of methanol. It is important to remember, however, that methanol never appears alone. In every case, ethanol is present, usually in much higher amounts. Ethanol is an antidote for methanol toxicity in humans.[9]

The troops of *Desert Storm* were "treated" to large amounts of aspartame-sweetened beverages which had been heated to over 86°F in the Saudi Arabian sun. Many of them returned home with numerous disorders similar to what has been seen in persons who have been chemically poisoned by formaldehyde. The free methanol in the beverages may have been a contributing factor in these illnesses. Other breakdown products of aspartame such as DKP (discussed below) may also have been a factor.

In a 1993 act that can only be described as unconscionable, the FDA approved aspartame as an ingredient in numerous food items that would always be heated to above 30°C (86°F).

DIKETOPIPERAZINE (DKP)

Diketopiperazine (DKP) is a by-product of aspartame metabolism. DKP has been implicated in the occurrence of brain tumours. Olney noticed that DKP, when nitrosated in the gut, produced a compound which was similar to N-nitrosourea, a powerful brain tumour-causing chemical. Some authors have said that DKP is produced after aspartame ingestion. I am not sure if that is correct. It is definitely true that DKP is formed in liquid aspartame-containing products during prolonged storage. See Chart 1 below.

CHART 1:
Breakdown of aspartame and L-phenylalanine methyl ester, DKP, L-aspartylphenylalanine, and L-phenylalanine, at bottling time, after six months, and after thirty months*

	Date of Bottling	6 Months after Bottling	36 Months after Bottling
Aspartame	550.0 mg	155.34 mg	19.70 mg
L-phenylalanine methyl ester	0.0 mg	28.62 mg	13.01 mg
DKP	0.0 mg	135.66 mg	173.28 mg
L-aspartyl-phenylalanine	0.0 mg	158.31 mg	189.05 mg
L-phenylalanine	0.0 mg	42.22 mg	101.27 mg

(* From: Tsang, Wing-Sum, et al. (1985), "Determination of Aspartame and its Breakdown Products in Soft Drinks by Reverse-Phase Chromatography with UV Detection", *Journal of Agriculture and Food Chemistry*, vol. 33, no. 4, pp. 734-738.)

G. D. Searle conducted animal experiments on the safety of DKP. The FDA found numerous experimental errors occurred, including "clerical errors, mixed-up animals, animals not getting drugs they were supposed to get, pathological specimens lost because of improper handling" and many other errors.[12] These sloppy laboratory procedures may explain why both the test and control animals had 16 times more brain tumours than would be expected in experiments of this length.

In an ironic twist, shortly after these experimental errors were discovered, the FDA used guidelines recommended by G. D. Searle to develop the industry-wide FDA standards for Good Laboratory Practices.[11]

DKP has also been implicated as a cause of uterine polyps and changes in blood cholesterol by FDA toxicologist Dr Jacqueline Verrett in her testimony before the US Senate.[13]

AILMENTS RESULTING FROM ASPARTAME

The components of aspartame can lead to a wide variety of ailments. Some of these problems occur gradually; others are immediate, acute reactions.

There is an enormous population of people who are suffering from symptoms contributed to by aspartame, yet they have no idea why herbs or drugs are not helping relieve their problems. There are other users of aspartame who appear not to be suffering immediate reactions to aspartame. But even these individuals are susceptible to the long-term damage caused by excitatory amino acids, phenylalanine, methanol and DKP. A few of the many disorders that are of particular concern to me include the following:

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Birth Defects

Dr Diana Dow Edwards, a researcher, was funded by Monsanto to study possible birth defects caused by the ingestion of aspartame. After preliminary data showed damaging information about aspartame, funding for the study was cut off. A genetic paediatrician at Emory University has testified that aspartame is causing birth defects.[7]

In the book, *While Waiting: A Prenatal Guidebook*, by George R. Verrilli, M.D. and Anne Marie Mueser, it is stated that aspartame is suspected of causing brain damage in sensitive individuals. A foetus may be at risk for these effects. Some researchers have suggested that high doses of aspartame may be associated with problems ranging from dizziness and subtle brain changes to mental retardation.

Cancer (Brain Cancer)

In 1981, Satya Dubey, an FDA statistician, stated that the brain tumour data on aspartame was so "worrisome" that he could not recommend approval of *NutraSweet*.[14] In a two-year study conducted by the manufacturer of aspartame, 12 of the 320 rats fed a normal diet and aspartame developed brain tumours, while none of the control rats had tumours. Five of the 12 tumours were in rats given a low dose of aspartame.[15]

The approval of aspartame was a violation of the Delaney Amendment which was supposed to prevent cancer-causing substances such as methanol (formaldehye) and DKP from entering our food supply. The late Dr Adrian Gross, an FDA toxicologist, testified before the US Congress that aspartame was capable of producing brain tumours. This made it illegal for the FDA to set an allowable daily intake at any level. He stated in his testimony that Searle's studies were "to a large extent unreliable" and that "at least one of those studies has established beyond any reasonable doubt that aspartame is capable of inducing brain tumours in experimental animals..." He concluded his testimony by asking, "What is the reason for the apparent refusal by the FDA to invoke for this food additive the so-called Delaney Amendment to the Food, Drug and Cosmetic Act?... And if the FDA itself elects to violate the law, who is left to protect the health of the public?"[16]

Footnotes:

1. Department of Health and Human Services, "Report on All Adverse Reactions in the Adverse Reaction Monitoring System", 25 and 28 February 1994.
2. Compiled by researchers, physicians, and artificial sweetener experts for Mission Possible, a group dedicated to warning consumers about aspartame.
3. Blaylock, Russell, M.D., *Excitotoxins: The Taste That Kills.*
4. Life Sciences Research Office, *Safety of Amino Acids*, FASEB, FDA Contract No. 223-88-2124, Task Order No. 8.
5. FDA Adverse Reaction Monitoring System.
6. Wurtman and Walker, "Dietary Phenylalanine and Brain Function", Proceedings of the First International Meeting on Dietary Phenylalanine and Brain Function, Washington, D.C., USA, 8 May 1987.
7. Hearing Before the Committee on Labor and Human Resources, First Session on Examining the Health and Safety Concerns of *NutraSweet* (aspartame), United States Senate.
8. Account of John Cook as published in: Mullarkey, Barbara, "How Safe Is Your Artificial Sweetener?", *Informed Consent* magazine, September/October 1994.
9. Monte, Woodrow C., Ph.D., R.D., "Aspartame: Methanol and the Public Health", *Journal of Applied Nutrition*, 36(1):42-53.
10. US Court of Appeals for the District of Columbia Circuit, No. 84-1153, *Community Nutrition Institute and Dr Woodrow Monte v. Dr Mark Novitch, Acting Commissioner, US FDA*, 24 September 1985.
11. Mullarkey, Barbara, "Aspartame Time Line", *Informed Consent*, May/June 1994.
12. FDA Searle Investigation Task Force, "Final Report of Investigation of G. D. Searle Company", 24 March 1976.
13. Testimony of Dr Jacqueline Verrett, FDA toxicologist, before the US Senate Committee on Labor and Human Resources, 3 November 1987.
14. Internal FDA memorandum.
15. Analysis prepared by Dr John Olney as a statement before the Aspartame Board of Inquiry of the FDA. Also, Blaylock, Russell, M.D., *Excitotoxins: The Taste That Kills.*
16. Congressional Record SID835:131, 1 August 1985.

Continued in the next issue of NEXUS...